





THE MOST ANCIENT

and learned playe, called the Philosophers
game, inuented for the honest recreation of
students, and other sober persons, in passing the
tediousnes of tyme, to the release of their
labours, and the exercise of
their wittes.

Set forth with such playns precepts, rules, and
bles, that all men with ease may vnderstand
it, and most men with pleasure pra-
ctise it. By W. F.




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Roubothum, the yere 1563. the.21. of May.

circumscriptum



The Physiognomie here figured, appears by Paynters Art:
But valiant are the vertues that, posseſſe the inward parte.
Which in no wiſe may paynted be, yet playnely do appeare.
and ſhine abroad in euery place with beames moſt bright &c.

norable, the Lord Robert Dudley, Mai-
ster of the Queenes Maiesties horse,
Knight of the most honorable order
of the Garter, and one of the Queenes
maiesties priue Counsell, IAMES
ROYBOTHAM heartelye
wisherh longelife, with
encrease of godly ho-
nour and eternall
felicicie.

 Ith that your honour is
(full bent,
(right honorable lord)
To vvise dō & to godlines
vvith true faithfull accord

Sith that in deed you do delyte,
in learning and in skyll:
The shovv vvherof doth vvell expresse
a perfect godly vvyll.

Sith that also you haue in hand,
affayres of force and vvaight:
And study do both day and night,
to set all thinges full straight,

a.ij. I thought

THE EPISTLE

I thought therefore your honour should
not lacke some godly game:

VVhereby you might at vacant times
your self to pastyme frame.

VVhereby I say you might release,
such trauailes from your mynde:
And in the meane vvhile honest mirth
and prudent pastyme fynde.

Remembring then this auncient play,
vvhere vvifdome doth abound:
Called the Philosophers game,
me thinkth I haue one found.

VVhich may your honour recreate,
to read and exercise:
And vvhich to you I here submit,
in rude and homly vvise.

Pithagoras did first inuent,
this play as it is thought:
And therby after studies great,
his recreation sought.

Yea

DEDICATORY.

Yea therby he vvould vvell refreshe,
his studious vverry braine:
And still in knowvledge further vvade
and plye it to his gaine.

Accompting that a vvicked play,
vvherin a man leudely:
Mispendes his tyme & vvit also,
and no good getts thereby.

But greuoufly offenes the Lord,
and so in steed of rest:
VVith trouble and vexation great,
on euery side is prest.

Most games and playes abused are,
and fevve do novv remaine:
In good and godly order as,
they ought to be certaine.

For vvhy?all games should recreat,
the heuy mynde of man:
And eke the body ouerlayde:
vvith cares and troubles than.

THE EPISTLE

But novv in stead of pleasant mirth,
great passions do arise:
In stead of recreation novv,
reucengings vve practise.

In stead of loue and amitie,
long discords do appeare:
In stead of truth and quietnes,
great othes and lyes vve heare.

In stead of frendship, falshode novv,
mixed vvith cruell hate:
VVe finde to be in playes & games,
vvhich dayly cause debate.

Pithagoras therfore I saye,
to make redresse herein:
Inuented first this godly game,
therby to flye from sinne.

Since vvhich time it continued hath,
in Frenche & Latin eke:
Still exercisde vvith learned men,
their comforts so to seeke.

VVherby

DEDICATORY.

VVherby vvithout a further profe,
all men may be right sure:
That this game vnto grauitie,
and vvifdome doth allure.

Els vvould not that Philosopher,
Pithagoras so vvysc:
Haue laboured vvith diligence,
this pastime to deuyse.

Els vvould not so vvell learned men,
haue amplified the same:
From tyme to tyme vvith trauell great,
to bring it into fame.

But let vs nerer novv proceed,
and come vve to theeffect:
And then shall vve assuredly,
this pastime not neglect.

For it vvith pleasure doth assvvage,
the heauy troubled hart:
And vvith lyke comforts driues avway,
all kynde of sourging smart.

THE EPISTLE

The mynde it maketh circumspect,
and heedfull for to bee:

The tyme that theron is bestovvd,
is not in vaine trulye.

The body it doth styrre and moue,
to lightfomnes and ioye:

The senses and the povvers all,
it no vvyse doth annoyē.

It practiseth Arithmeticke,
and vse of number shovvth:

As he that is conning therein,
assuredly vvell knovvth.

In Geometrie it truly vvades,
and therein hath to do:

A learned play it is doutlesse,
none can say nay thereto.

Proportion also musicall,
it ioynes vvith thother twwayne:

So that therin three noble artes,
are exercisde certayne.

VVhat

DEDICATORY.

VVhat game therfore lyke vnto this,
may gotten be or had?
There is not one that I do knowv,
the rest are all to bad.

It causeth no contention this,
nor no debate at all,
By this no hatred vvrath nor guyle,
in any vvise doth fall.

It stirreth not such troubles that,
our frend becomes our foe:
It moueth not to mischiefe this,
as many others do.

Let vs auoyde the vvorst therfore,
and cleue vve to the best.
So shall vve shunne all vvickednes,
and purchase quiet rest.

So shall vve serue the liuing Lorde,
and vualke after his vvill:
So shall vve do the thing is good,
and flye that vvich is yll.

THE EPISTLE

So shall vve liue right christianlyke,
and do our duties vvell:
So shall vve please both god & prince,
none shall vs need compell.

And then the Lord of his mercie,
vwill prosper vs alvvayes:
And graunt vs here to haue on earth,
full many godly dayes.

Yea then the Lord of his goodnes,
and grace celestiallyl:
VWill guyde and gouerne our affairs,
and blesse our doings all.

VWhich Lord graunt to your honour
good dayes & long to haue: (here,
vvith much encrease of helth & vvellth
and from all hurt you saue.

Your honours most humble,
James Roubothum.

To the Reader.



Dout not but some
man of severe iudge-
ment so soone as he
hath ons read þ title
of this boke wyl
immediatly sai, that I had more
need to exhort men to worke,
then to teach thē to play, which
censure if it procede not of such a
stoward morositie. that can be
content with nothing but that
he doth himself, I do not only
well adimt, but also willingly
subinit my self therto. And if I
could be perswaded that men at
mine exhortation wold be more
diligent to labour, I would not
only wyte a treatise twice as lōg
as this, but also thynke my
whole time wel bestowed, yf I
did

To the Reader.

Did nothing els, but intent,
speake, and write that which
might exhort, moue, & persuaide
them to the furtherance of the
same. But if after honest labour
and trauell recreatiō be requisite,
(and that neede no further pro-
bation because we fauour the
cause wel inough) I had rather
teach men so to play, as both
honestye may be reserued, their
wittes exercised, they their sel-
ues refreshed, and some profit
also attayned, then for lacke of
exercise to see them either passe
the tyme in idlenes, or els to
haue pleasure in thyngs fruitles
and vnecomely. And if great
Emperours and mighty Mo-
narches of the world haue not
bene ashamed by wytyng boo-
kes to teache the art of Dyce
play,

To the Reader.

playing, of all good men abhorred, and by all good lawes condemned: haue I not some colour of defence, to teache the game, which so wyse men haue mented, so learned men frequented, and no good man hath neuer condemned: The inuention is ascribed to Pythagoras, it beareth the name of Philosophers, prudent men do practise it, godly men do praise it. But because many herein (as in a play) haue challenged much authoritie, they haue filled this game with much diuersitie. In which as I could perceiue the most disorders of playing to consist in three kindes, so haue I playnly and chiefly set the forth in Englishe not as though there might not more diuersities be espied, but that

To the Reader.

that I thought these to them
whom I haue written to be suf-
ficient. yet for that I woulde be
lothe, frō playe & game, to fall to
earnest contention, if any man
in this doing or any part thereof
shall think I haue done amisse,
and will do better himself, so
far am I from enuying his
good proceeding, that I
wil be right glad, and
geue him heartye
thankes there-
fore.

All things belonging to this game
for reason you may bye:
At the booke shop vnder Bochurch,
in Chepesyde redilye.

The bookes ver- dicte.

VWanting I haue bene long truly,
In english language many a day:
Lo yet at last novv here am I,
Your labours great for to delay,
And pleasant pastime you to shovve,
Mynding your vvits to moue I trovve.

For though to mirth I do prouoke,
Vnto VVisdome yet moue I more:
Laying on them a pleasant yoke,
VWisdom I meane, vvhich is the dore,
Of all good things and commendable:
Dout this I thinke no man is a ble:

C A T O.

Interpone tuis interdum gaudia curis:
Vt possis animo quemuis sufferre laborem.



The diffinition

That moſte auncient and learned playe, called the Philoſophers game, beinge in Greeke termed *πυθμομαχία*, is as much to ſaye in Engliſhe, as the battell of numbers: Numbers be either eue or odde; wherefore the euen parte is againſt the odde, either parte hauinge a kyng; which being taken of the ſmallerſes part, and a triumph celebrated within his campe, the game is ended.

Of diuerſe kyndes of playinge.

As ponde the diuerſe kyndes of playinge this game, we ſhall ſette forth three ſortes, of which the reader maye choſe whether of them he liketh beſte. And of all thoſe three, we ſhall

A.j. gus

The Philosophers game.

gyue suche shoyte and easye rules, that no man (although he were altogether ignorant in Arithmetike) shall fynde the game so hard, but that he may learne to playe it.

Of the partes of thys Game.

HE that wyll learne thys game, any of the thre waies, muste firste be instructed of these fyre partes. The table as the fiede . 2. the menne and the numbers of them as the hoste . 3 . the placynge of them, as the encampynge. 4. the order of playe and remouynge the men, as the marchynge and syghtynge 5. the manner and lawes of conquerynge and taking. 6. and last of al the triumphe after the victorie,

Of these partes in the fyrst kynd of playng.

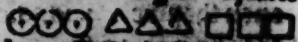
The

Of the men.

Of the men.

The men be in number. 4.8. other.
 1.4. be of one like & must be know-
 en by one colour, and. 2.4. on the
 other like, whereby also must be marked
 with a contrary colour, as white and
 black, blue and redde, or what co-
 lours thou like best. But in the cate-
 wing these. 1. things must be observed,
 1. that as lower part of every man
 (except the two knees) must be mar-
 ked with the counterayres colour, that
 when he is taken, he maye charge his
 coat and serue hym with some be is
 painter.

The seconde thing considered in the
 men, is their fashion: for of eyther sort,
 4. are rounds, other. 3. are triangles & 7.
 (the king making. 8) are squares. The
 fashion is such roundes triangles squares



The kynges because they consist of all
 these figures, as it is known by the lear-
 ned speculation of the numbers, beare

A.ij. the

The Philosophers Game.

The cause of all these kinds, his foundations are the squares, on which are sette, the triangles & vpon them rounds: But this difference is betwene the kinges, & the king of the euen numbers, hath a pointed toppe, the king of & odde numbers is not pointed, the cause dependeth vpon & consideratio of there numbers by which they arise into pyramidall fashion. The third thing considered in the men, is the number that must be written as quene vpon them which to learn plainly to practise make these short rules.

There be of eke kynde of men, the rankes or orders.

The first ranke or order of rounds be & digits euen or odde namely of the euen. 2. 4. 6. 8. of the odde. 1. 3. 5. 7. 9.

The second order of rounds are found by multiplyinge these digits by themselves as. 2. times. 2. is. 4. 3. times. 3. is. 9. Of the euen they be . 4. 16. 36. 64. . of the odde they be. 9. 25. 49. 81.

The first order of the triangles are found by addinge the of the rounds together

The first order of squares.

one of the first order and another of the seconde order, as .1. and .4. make .5. 3. and .9. make .12. on the even side they are these . 6. 10. 14. 18. on the odde side . 1. 3. 5. 7. 9.

The second order of triangles be made by addeinge one to euery one of the first order of roundes, and then multiplying that number in hym selfe. as .1. is one of the first order of roundes, thereto adde one, it is .2. then .2. tymes .2. is .4. a triangle of the seconde order, on the even side. A like wise to this a round on the odde side, adde .1. so is it .4. then .4. tymes .4. is .16. On the even parte, they be .9. 16. 25. 36. on the odde parte .1. 4. 9. 16. 25.

The first order of squares (in whiche are containned the hynges) be made by addeinge two triangles together, one of the first order, and another of the seconde, as .6. and .9. make .15. likewise 12. and 16. make .28. Amonge the even they be . 15. 45. and . 91. the hynges. 159. amonge the odde they be . 28. 66. 120. and . 190. the hynges.

A. lttj.

The

The last order of figures to be shown.

The last order of figures to be shown, by
 doubling of every one of ϕ the other of
 roundes, and after nothing else, last of all
 by multiplying that number in it self, as
 twice. 2. is. 4. and. 1. added is. 5. so. 5. times
 5. is. 25. likewise thre. 3. is. 9. 1. added is
 7. then 7. times. 7. is. 49. These be on
 the even syde. 25. 81. 169. 289. And of the
 odde syde. 49. 121. 225. 361.

These numbers must be sette vppon
 the men both on the upper side, & also on
 the nether side. Except one of ϕ kings,
 which must with the whole number of
 their pyramis, be marked, ouerly on the
 bottom. Because the sydes muste haue
 other numbers, namely the highest point
 of the even kyng, must haue. 1. ϕ rounde
 next vnder him marke with. 4. the vpper
 most triangle w. 9. the nethermost w. 16.
 The vpper most square muste haue. 49.
 The nethermost square shall haue. 36.
 The king of the odde vpon his head, whi
 che is a rounde, not pointed hath. 16. vpon
 on his first triangle. 16. on the second tri
 angle. 36. vpon the square. 49.
 vpon

The Playes game.

upon the lowest square. 64.

Finally it shalbe good for the auoy-
dance of confusion, to drawe a line vnder
every number. Als may you take one
for another, as ⑤ the even round & ⑥ the
odde rounde, may be taken one for ano-
ther with oute this lyne as some suche
marke, lykewise Δ and \triangle Triangles
bothe of one syde. And this is suffici-
ent for the men, the fashon, colours and
numbers.

The reason of these num- bers and the knowledge of their proportion.

For them that seke the speculati-
on of these numbers, rather then
the practise for playing, and haue
some sight in the sciens of Arithmetike,
some thyng must be sayde of proportion.
In this purpose there be three kyndes
of proportion, Simple, superparticu-
lar and superpartiens.

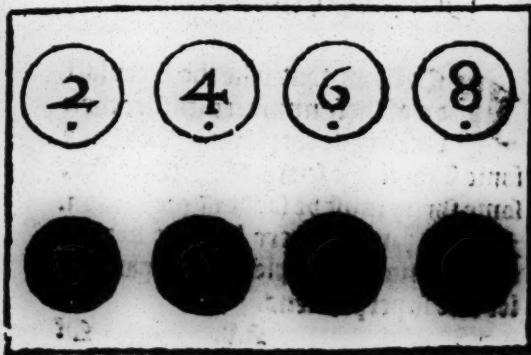
A. b.

Df

The philosophers game.

Of multipler.

MU L T I P L E proportion, is
when a great number conteyneth
a lesse number manye tymes, and
leaveth nothinge, as . 8. conteyneth . 2
fower tymes and nothing remaineth. 16.
conteineth . 4. &c, this proportio seemeth
best to agree with roundes because the
one number conteyneth the other and
nothyng remaineth as the fyfte order
of roundes be.



The philosophers game.

The second order be these.

doble. quadruple. sextuple. occuple.

2	4	6	8
4	16	36	64

pro-
por-
tion

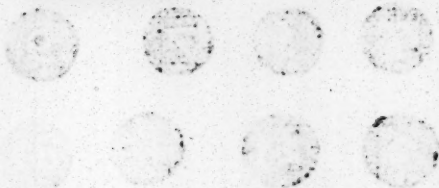
triple. quinta-
ple. septupl. noncuple

3	5	7	9
9	25	49	81

The phisophes game.

**Of superparticular propo-
tion.**

Super particular proportion is when
a greater number containeth a lesser
with one part of it, which may mea-
sure the whole, as 12. containeth 9. and
3. whiche is a thyrde parte of nine. 6. con-
tyneth. 4. and. 2. that is one halfe to 4.
Thys proportion beinge the chiefe, next
vnto multipler, is beste figured by a
trianguler forme, whiche hath the fewest
lynnes and angles next vnto a circle. For
the manner of thys proportion consider
thys figure.



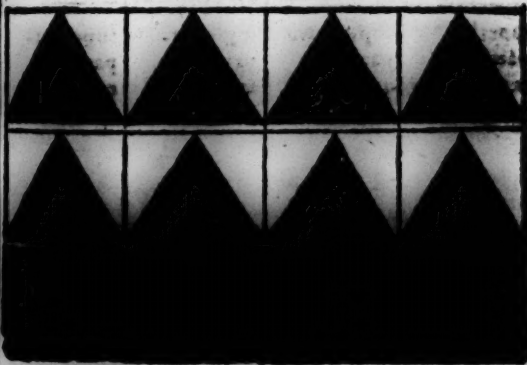
The Rhinoceros game.

The first order of squares.

6	2.0	4.2	7.2
9	2.5	4.9	8.1
15	45	91	153

suppar-
ticulres
addod

being
the
square



The Philophets game.

The second order followeth.

thirde

5.

10.

fyft

9.

36.

feventh

13.

78.

ninth

17.

136.

15.	43.	91.	133.
23.	81.	169.	289.

superbi-
partiens
tertias,

supquadru-
partiens
quintas.

supferru-
partiens
septimas.

supoctu-
partiens
nonas

Fourth.

The Philosophers game.

Fourth	sixth	eighth	ninth
7.	11.	15.	19.
21.	25.	30.	37.

supertri-
partiens.
quarta.

superqua-
ruparties.
septimas.

supersep-
tupartiens.
Octavas.

supernon-
partiens.
decimas.

B.I.

The Philosophers game.

Of the kings.



The kings conteine in them suche numbers, as beyng all added together, make the whole pyramidall number, the lowest square of the even, is 36. which riseth of the multiplying of .6. in it selfe. The next square that must be lesse, is.25. arisinge by the multiplyinge of fyve in it self and so followeth. 16. of.4. then.9.of.3. laste.4.of.2. and single.1. all these added together, make.91. After the same maner consisteth the king of odde. The lowest square is.64. arisinge of .8. multiplied in himselfe. The next.49.of 7.times

The Philosophers game.

7.times 8. 7.then. 36.of. 6, 25.of. 5.and. 16.of
4. these numbers make the whole pyra-
midall number. 190. which because it ri-
seth not to the poynt of one, oughte not
to be sharpe poynted, as hath beene
sayde before.

Of the placing, encam- ping or setting in arraie.

To retorne againe to the plaine and
easie playing of this game, next to
the armie & their armour, follow
ether the order of their battel or encam-
ping. Whiche because it is more playne
and easely seen which the eye, then lear-
ned by the eare, I referre thee vnto the
table where the battell is appoynted in
suche order as this kynde of playe
requireth.

52	68					69	88
51	54	52	20	24	64	68	55
9	9	4	96	93	69	24	48
		8	4	9	8		
		9	7	5	3		
100	90	81	49	25	9	2	16
750	120	64	56	30	70	66	28
367	235					27	49

11

T

ky
me
the

T

R.O

T

brun

The Philosophers game.

¶ Of the marching & remouing of the men.

The battell being thus placed, it followeth next, to knowe the manner of marching & remouing, for euery kind of men, both their proper kind of motion, and for the we muste speake of the roundes.

¶ The motyon of the roundes.

The roundes muste move into the space that is next vnto them (as we will see, as in the table, from the space A. to any of these. B. C. D. or E.

¶ Of the triangles.

The triangles passe three spaces counting that in which they stande for one, and that into which they do remove for another, that is leaping ouer
B.ij. one

¶ Of the Phillophers game.

one space. As from the space. A. he maye remoue into any of these spaces. F. B. D. or. J. this is the motion of the triangle in marchyng or takyng. But in flyyng he maye remoue the knyghtes draught of the chesse, as from. A. into. F. or. B. or. D. or. J.

¶ Of the Squares.

The Squares remoue into the fourth place from them, that is leaping ouer two, right forwarde or sydelong, as from the place of. A. to any of these spaces. L. R. P. K. flyyng they maye remoue after the knyghtes draught, but that they must passe foure spaces, as from. P. to. P. or. L. or. K.

And this for the marchyng and remouyng of the men, where note, that with they flyyng draughts they can take no man, but it neede be helpe to besiege a man.

¶ Of the Kyngs marchyng.

The kyngs because they beare þe forme of al þe kyngs, may remoue any

The Philosophers game.

of all they draughts when they list, in-
to the next with the rounde, into the
thynde with the triangle, and into the
fourth with the square, and finally in all
poyntes lyke the Queene at the Chesse,
sawing that he can not passe aboue fours
spaces at the most.

¶ Of the maner of taking.

The men may be taken five waies,
namely by Equalitie, Obduction,
Addition, Substraction, Multipli-
cation and Diuision, and also if you
will, and so agree, by

Propoztion	}	Arithmetticall.
		Geometricall.
		Musickall.

¶ Of Equalitie.

W. H. G.

W. G.

The third rule of the game.

By equality men may be taken, when one man after his motion, killeth his enemy being of the same number that he is, standing in such place as he may remove into, then may he take away his enemy and not remove into his place, as in this example. 9. a triangle of the eue army, after he hath removed, espyeth 9. a rounde of the odde army, hym may he take up and not remove into his place. But if 9. the triangle, espye nine the rounde, before he remove, standing in his dynght, he may take hym up and remove into his place.

These men may be taken by equalitye 9. 16. 25. 36. 49. 64. 81. because they are found in both the armies, and in as much as anye man taken beinge turned wryth his bottome vpward, et hat beareth his aduersaries colloure, may serue his enemye on whose side he is taken, there maye yet be taken by equalitye. 4. and 6.

The way to take a castle.

Of taking by obsidion.

By obsidion anye man maye be taken
even the kinge him selfe ; if he be so
compassed with 4. men, that bys laze
full draught be hindered, as for example
the round standing in the place of .1. and
4. men of what kynd it skylleth not, oc-
cupping the places of .2. 3. 4. 5. after you
have set your last man in bys place maye
be taken up , also if a triangle be endo-
sed, as in. a. with any foure men standing
in. b. c. d. e. he may be taken, even so maye
a square be taken : Also Triangles and
squares may be beseged, if al 4 foure men
or any of them, the rest standing nearer,
doe stande in the thyrde or fourth space
from them so that they have no waye to
remoue , as a triangle or square standing
in. a, may be beseged by 4. men or anye
of them (the reste standinge nearer) in.
f. g. h. i. Also a square standing in. a.
maye be taken by obsidion, yf the folowen

men,

men,

~~Chapter of Addition.~~
men or some of them (the rest standing
neare) stande in A. B. C. And
this is sufficient for Addition, by which
euery man may be taken in maner and
forme as it hath bene taught.

Of taking by Addition.

When two numbers are so brought
that they synde one of theyr ene-
mies, which is as muche as bothe
they beyng added together, standing in
such place as bothe they might remoue
into, they shall take hym up, without
remouing into his place, so soone as the
latter of those two is set downe, but
if the aduersaries men be in their dange-
ger before they remane, one of them
whether the player lyst, shalbe remoued
into the place of that man which is ta-
ken by Addition. As for example. 12. the
triangle is in. A. if you can bring fire the
rounde, to stande in. B. and. 6. the trian-
gle to stande in. C. because. 6. and. 6. be-
ing added make. 12. and bothe maye re-
moue to. A. you maye take up the tri-
angle

The Addition of Squares.

angle. 12. by addition. Also the square standing in. 13. and. 49. the rounde standing in. 15. or elles. 49. the square standing in. 1. which being added together make. 69. which standeth in. 8. That take the sayde square. 169. by Addition,

Of taking by Subtraction.

When two men do so stande, that the lesser beyng subtracted out of the greater, the number remaining, is all one with the aduersaries man that standeth in bothe their draughtes, so soone as the latter is set in his place, he may take awaye the aduersarie, not remouing into his place, vntill he finde him so before he remoue: as for example, 2. the rounde standing in. 15. & 9. the triangle standing in. 6. shall take the aduersarie. 7. standynge in. 8. so 2. out of. 9. remaineth. 7. Another example.

The

The philosophers game.

The rounde. 2. standyng in .A. maye be taken by. 3. the Triangle standyng in .B. and the square. 28. standyng in .D. for take. 28. out of. 30. and the remaineth. 2.

Of takynge by multiplication.

When two numbers stande so, that being multiplied one by the other, the producte is all one with their aduersaries man standyng in bothe their draughts, they may take that man so sone as the latter is placed. And if they lye so before thei remone, being so left of ϕ aduersarie, one of them shal succede in his place that is taken, as in example. The rounde. 3. standeth in .D. and 5. standeth in .C. these two shal take the square 15. standyng in .A. because three tymes fyue is. 15. another example. The rounde 2. standyng in .B. and the triangle. 6. standyng in .A. shal take thei enemye the triangle. 12. standyng in .A. by multiplication for. 2. tymes 6. is. 12.

The Philosophers game.

Of takyng by Diuision.

By diuision a matre maye be taken,
when twoo of hys cncirpes doe so
stand, that one of them beyng deu-
ded by the other, the product is the same
that their enemye is, standyng in their
danght, immediatly after the latter is
placed, the enemye may be remoued. If
he were left in their danght before re-
mouyng, one of them may remoue into
his place, an example. The round 4. stan-
dyng in B. and the triangle. 20. standing
in. F. may take þ aduersarie. 5. standing
in. A. by diuision, bycause. 4. in. 20. is con-
teyned. 5. tymes. Another example, the
round. 5. standyng in B. and the triangle
30. standyng in. F. maye take their ene-
mye. 6. standyng in A. for. 5. in 30. is con-
teyned. 6. ty. nes.

Of the takynge of the kynges.

The

The philosophers game

The game is neuer wonne, vntyll the King be taken. The Kings (as hath bene sayde) may remoue anye way, so they passe not the fourth space. They can not be taken by equalitie. But by obsidion the whole kyng maye be taken away. Also his whole number at ones, that is. 91.02.190. by Addition, by Substraction, by Multiplication, or by Diuision. Also he maye be taken by partes, when any of hys syde numbers maye be taken then leseeeth he that draughte, as when anye of hys square numbers is gone he can not remoue the square draught, and so of the rest, tyl nothing of him be left, then muste he be taken away, and the triumph prepared.

The lawe of prisoners.

When any is taken captiue, he must be tourned with his conquerers collo: byward & placed in the hindermost space of his victors campe, and from thens being remoued must fight against his conquerours enemies, and serue him also to make his triumphe.

A table

20. A Table to take any of the three by addition subtraction, multiplication or division.

Addition.			Subtraction			Addition			Subtract.		
1			4			8	56	64	30		
1	2	3	4	4	8		9		30	36	66
1	3	4	4	5	9	9	36	45	30	42	72
1	4	5	4	8	12	9	72	8	30	90	120
1	5	6	4	12	15	9	81	90	30	91	121
1	6	7	4	16	20	9	91	100	36		
1	7	8	4	45	49		12		36	36	72
1	8	9		5		12	16	28	36	45	81
1	15	16	5	7	12	12	30	42	36	64	100
1	120	121	5	15	30		15		42		
2	2		5	20	25	15	30	45	42	49	91
2	3	5	5	25	30	15	45	64	45		
2	4	6		6		15	66	81	45	nothing	
2	5	7	6	6	12		16		49		
2	6	8	6	9	15	16	10	35	49	72	121
2	7	9	6	30	36	16	56	72	49	120	169
2	28	30	6	36	42	16	153	169	56		
2	64	66	6	66	72		20		56	64	120
3	3			7		20	25	45	56	169	225
3	4	7	7	8	15	20	36	56	64		
3	5	8	7	9	16	20	100	120	64	225	289
3	6	9	7	42	49		25		72		
3	9	12	7	49	56	25	56	81	72	81	153
3	12	15		8		25	66	91	72	153	225
3	42	45	8	12	20		28		72	28	161
			8	20	28	28	36	64	81	nothing	
			8	28	36	28	72	100			

The Philosophers game.

Addition.	Multiplication & Division.					
90	2			5	9	45
90.100.150	2	3	6	5	20	100
91	2	4	8	5	45	125
91 nothig	2	6	12	6		
100	2	8	16	6	6	36
100. noth.	2	15	30	6	7	42
120	2	28	56	6	12	72
120 169.289	2	36	72	6	15	90
121	2	45	90	6	20	120
117.169.190	3			7		
153	3	4	12	7	8	56
189	3	5	15	8		
190 noth.	3	12	36	8	9	72
225	3	15	45	8	15	120
289	3	30	90	9		
361	4			9	9	81
	4	4	16	9	15	135
	4	5	20			
	4	7	28			
	4	9	36			
	4	16	64			
	4	25	100			
	4	30	120			
	5					
	5	6	30			

The Philosophers game.

By this Table any man though he haue small or no skill in Arithmetick, maye learne to playe at this game, and in playinge learne some parte of Arithmeticke.

¶ Of takynge by proportion.

If the Gamesters be disposed, they maye take men also by proportion, Arithmeticall, Geometrical, or Musickall. But because it is not necessarily required that they shoulde so do, I wyll first prosecute the maner of triumph, in which also they maye learne to take by proportion, as afterwarde shalbe seene. For when they can ioyne two or thre of their men to one of their aduersaries men in such order as the triumph is set, so that those thre or foure numbers haue anye of these three proportions they maye take their aduersaries man.

The Philosophers game.

¶ Of the triumphe.

When the King is taken, the triumph must be prepared to be set in the aduersaries campe. The aduersaries campe is called al the space, that is betwene the first front of his men, as they were first placed, vnto the neither ende of the table, conteyning. 40. spaces or as some wil. 48. When you entend to make a triumph you must pzoclaine it, admonishing your aduersarie, that he medle not with anye man to take hym, whiche you haue placed for youre triumphe. Furthermore, you must byng all your men that serue for the triumph in their direct motions, and not in theyr flying dyaughtes.

To triumphe therefore, is to place three or foure men within the aduersaries campe, in propoztion Arithmetical, Geometrical or Muscical, as wel of your owne men, as of your enemyes men that be taken, standing in a right lyne

The 12th. of the 1st. booke.
lyne, direct oꝝ crocke, as in. **D. A. B.** oꝝ els
5.1.3. if it consist of three numbers, but if
it stande of foure numbers, they maye
be set lyke a square two agaynst two, as
in. **C. B. D. C.** 03.2.3.4.5. and after the
same maner muste you set them so that
your aduersaries man make the thyꝛde
oꝝ fourth, when you take by proportion.

¶ Of dyuers kyndes of triumphes.

There be thre kyndes of triumphes
a great triumphe, a greater tri-
umphe, and the greatest and moste
noble of all.

¶ Of the great triumph.

The great triumph standeth in pro-
portion, eyther Arithmetical,
Geometrical, oꝝ Musickall onely.

C. ij.

¶ Of

The Philosophers game.

Of Arithmetical proportion.

A Rithmetical proportion, is when the mydle number differeth as much from the first, as from the thyrde, that is to saye, when the thyrde hath so many more, from the seconde, as the seconde hath from the firste, as. 2. 4. 6. Here, two, is the distans, so 4. exceedeth 2. by two, & 6. is more then foure by. 2.

A rule to fynde out Arithmetical proportion betwene the firste and the laste.

When you haue the first and the last if you woulde fynde out the mydle in proportion. Adde the first & the last together, and deuide the whole into 2. so the halfe is the mydle in proportion
as

The Philosophers game.

as I would knowe what is the middle
number in proportion betwene .5. and
25. first I adde .5. to .20. that is .20. the half
of thirtie is .15. whiche is middle in pro-
portion betwene .5. and .20. so haue

I .5. .15. .25. in Arithme-
ticall propor-
tion.

✕

C. iij.

A table

**A Table of all the Arithmetical
proportions that be in
this game.**

2	3	4	6	7	8	28	64	100
2	4	6	6	9	12	30	36	42
2	5	8	6	36	66	42	49	56
2	7	12	7	8	9	42	66	90
2	9	16	7	16	25	49	169	289
2	15	28	7	64	121	56	64	72
2	16	30	9	12	15	72	81	90
3	4	5	9	45	81	49.		
3	5	7	9	81	153			
3	6	9	12	16	20			
3	9	15	12	20	28	49.		
4	5	6	12	42	72			
4	6	8	12	66	120			
4	8	12	15	20	25	49.		
4	12	20	15	30	45			
4	20	36	15	120	225			
4	30	56	16	36	56	49.		
5	6	7	20	25	30			
5	7	9	20	28	36			
5	15	25	20	42	64	49.		
5	25	45	28	42	56			

The Philosophers game.

Of Geometrical proportion.

Geometrical proportion, is when the seconde hath that proportion to the first, that the thyrde hath to the seconde, as.2.4.8.as .4. exceedeth.2.by 2.so.8.exceedeth.4.by.4.

A rule to fynde the mydle number in Geometrical proportion.

Multiplye the firste by the thyrde, and of the product fynde out the roote square,so; that is the mydle, if the numbers haue anye roote square in whole numbers. The roote square is a number multiplied in it selfe, where, soze you muste seeke such a number, as multiplied in it selfe, maketh þe produce of the fyrst and the thyrde number multiplied one by the other.

E.iiij.

As

The 10 philosophers game.

As .20. multiplied by .45. is .900. the
roote is .30. square, whych multiplied in
it selfe is .900. But yf you lyfte not to
take suche paynes, here is a Table that
maye serue your tourne so; Geome-
tricall proportion to be bled
in this game.

¶ A table

The Philosophers game.

A table for Geometrical proportion.

2	4	8	16	36	81
2	12	72	20	30	45
3	6	12	25	30	36
4	6	9	25	45	81
4	8	16	36	42	49
4	12	36	36	66	121
4	16	64	36	90	225
4	20	100	49	56	64
5	15	45	49	91	169
9	12	16	64	72	81
9	15	25	64	120	225
9	45	225	81	90	100
16	20	25	81	153	289
16	28	49.		27.	

C.b.

CLOR

The Philosophers game.

¶ Of Musicall proportion.

Musicall proportion is when the differences of the first and last frō the middes, are the same, that is betwene the first and the last, as.3.4.6. betwene.3.and.4.is.1. betwene.4.and.6.is.2.the whole difference is.3. which is the difference betwene.6.and.3.the first and the last.

¶ A rule to fynde the first, when you haue the two last.

Multiplye the seconde by the thyrde, deuide the producte by the distans and the thyrde number, and the quotient is the first, as haueinge.6.and.12. I would fynde the first, 6.tymes.12.is.72, the difference betwene.6.and.12.is.6, whiche added to.12.is.18, deuide.72.by.18.the quotient is.4.so haue you.4.6.12. in Musicall proportion.

The Philosophers game.

CTo finde the mydle betwene
the first and the last.

Multiplie the first by the last , then
double the producc , and deuide
the whole by the first and the laste
added together, the quotient is then the
mydle number , As hauing .6. and .12. I
woulde knowe the mydle in Muscalle
proportion. First I multiplie one by the
other, the producc is .72. that doubled is
144, this deuided by .18. which is the ad-
dition, of .6. and 12. giveth the quotient
8. so haue I .6. 8. 12. in muscalle propor-
tion. And thus must you worke to fynde
out the thyrde in muscalle proportion.

But if you had rather playe then
worke , this table folowing
shall serue your
tyme.

CA table

The Philosophers game.

A table of Musical proportion.

2	3	6
3	4	6
3	15	16
4	6	12
4	7	28
5	8	20
5	9	45
6	8	12
7	12	42
8	15	120
9	15	45
9	16	72
12	15	20
15	20	30
5	45	225
30	36	45
30	45	49
72	90	120

17.

The Philosophers game.

Of the greater triumphe.

The greater victorie is, when foure numbers be broughte together, whiche agree in two proportions, either Arithmeticall and Geometricall, or elles Arithmeticall and Muscicall, or elles Geometricall and Muscicall. Of these three coniunctions the greater triumph consisteth, of the which the table followeth.

A table

29 A table of Arithmetical, and Geometrical proportion.

2	3	4	8	9	12	15	16
1	4	6	8	9	12	15	25
2	4	6	9	9	12	16	20
1	4	5	8	9	45	81	225
2	7	12	72	9	25	45	81
2	9	12	16	9	12	16	20
2	12	42	72	9	15	20	25
3	6	9	12	9	8	153	289
3	4	6	9	12	16	20	25
3	9	15	25	15	16	20	25
4	5	6	9	15	20	30	45
4	6	8	9	16	20	25	30
4	6	9	12	16	36	56	81
4	6	8	16	20	25	30	45
4	12	20	36	30	36	42	49
4	8	12	16	36	42	40	56
4	8	12	36	42	49	56	64
4	8	16	28	49	56	64	72
4	12	20	100	49.91.169.289			
4	16	28	49	56	64	72	81
4	16	28	64	64	72	81	50
4	20	36	100	72	81	90	100
5	9	15	25	52.			
5	15	25	45				
5	25	45	81				
6	9	12	16				
7	16	20	25				
7	49	91	169				
8	9	12	16				
8	64	120	225				

**Arithmeticall
and muscicall
proportion.**

**Geometricall
and muscicall
proportion
together.**

3	4	5	6	2	3	6	12
3	4	5	15	3	4	6	9
3	4	6	9	3	4	6	12
3	5	7	25	3	6	8	12
3	5	9	15	4	6	12	36
3	9	15	45	4	7	28	49
3	4	6	8	5	9	15	45
4	5	6	12	5	9	45	225
4	6	12	15	5	9	45	81
4	6	12	20	9	12	16	72
4	12	15	20	9	15	25	45
5	7	9	45	9	15	45	225
6	7	8	12	9	25	45	225
8	15	120	225	15	20	30	45
9	12	15	45	20	30	36	45
9	12	15	20	25	45	81	225
9	15	30	45	<hr/> 16.			
9	15	45	81				
12	15	20	25				
15	20	25	30				
15	20	30	45				
15	30	36	45				
15	30	45	90				
30	36	42	45				
72	81	90	120				

The Philosophers game.

Of the greatest triumphe.

The greatest triumph is of Arithmetical, Geometrical, and Muscical proportions all ioyned together.

Arithmetical, Geometrical, and Muscical proportions, all together.

2	3	4	6	6	8	12	16
2	3	6	9	6	12	15	20
2	4	6	12	7	12	42	72
2	5	8	20	8	15	64	120
2	7	12	42	8	15	120	225
2	9	16	72	12	15	16	20
3	4	6	8	12	15	20	25
3	4	6	9	15	20	36	45
3	5	9	15	15	30	45	90
3	5	15	25	30			
3	9	15	45				
4	6	8	12				
4	6	9	12				
4	7	16	28				
4	7	28	49				
5	6	25	45				
5	9	45	81				
5	25	45	225				
5	15	25	45				
6	8	9	12				

The Philosophers game.

And thus is the first kynde of playing at ende. And this is sufficient to teach you to play, but if you would learne to play conningly, you must vse to playe often, so shall you learne better then by anye pceptes or rules.

¶ Of the seconde kynde of playinge at the Philosophers game.

There is in this kynde of playing to be considered, the table, & men, the marking of them, the setting of them in araye, their marching, their lawes of taking, and the maner of triumphinge.

¶ Of the Table.

The Table is the same that was first described, namely a double chekbozd.

¶ Of the men.

The Whilosophers game.

The men be as before in number 48.23. on a syde, and two contrarye kynges of euen and of odde. They must be of diuers colours, as hath bene sayde, the bottome of euery one must haue his enemies colour, and his owne mark of number, differing in this point from the former playing, that the enemies men taken, may serue onely to celebrate a triumphe, but not to fight on his syde that taketh them.

Of the markyng of the men.

They be marked with the same numbers, that haue bene shewed before and therefore so are to be founde out as is taught before. But they be marked besyde their numbers, with cosse call signes, which be signes vsed in the rule called regula cosse, or algebra, betokening rootes, quadrats, cubes, soursquared quadrats, sursolides, & quadrates of cubes. All these. & signes must be con- teyned in thys game.

The

The Philosophers game.

{ of the roote. $2e$
 { of the quadrate. 3
 The { of the cube, or solide quadrat. ce
 signe { of the fouresquared quadrat. 33
 { of the sursolide. 13
 { of the squared cube. $3ce$

Every number maye be taken for a
 roote, as. 2. this number multiplied
 in it self is a square as. 4. The qua-
 drat or square multiplied by the roote ge-
 ueth a cube or solide square, as. 4. mul-
 tiplied by. 2. geneth. 8. that is a cube.

Multiplie the cube by the roote, so haue
 you a squared quadrat, as. 8. by. 2. geneth
 16. which is a quadrate of a quadrate.

Multiplie the square or quadrat of qua-
 drat by the roote, and the product is the
 sursolpde, as. 2. tymes. 16. is. 32. whiche is
 a sursolide. Multiplie the sursolide by
 the roote, and the product is the quadrate
 of a cube, as. 2. tymes. 32. is. 64. which is a
 quadrat of a cube. So haue you the roote
 quadrat, cube, quadrat of quadrat, surso-
 lide, quadrat of cube. 2. 4. 8. 16. 32. 64.

D. ij. So

The Philosophers game.

So. 2. referred to. 4. is a roote of a square,
referred to. 8. it is a roote of a cube. 2. re-
ferred to. 16. is the roote of a foure squa-
red quadrate. 2. referred to. 32. is the roote
of a surfolide. 2. referred to. 64. is y^e roote
of a quadrate of a cube. These numbers
muske haue the proper collicall signes.
Also one number hauing diuers relati-
ons, may haue diuers collicall signes, as
9. referred to. 81. being roote, hath the
signe of a roote $\sqrt{\quad}$, but being referred
to. 3. it hath the signe of a quadrate, for it
is a quadrate of. 3. and is thus signed. $\sqrt{\quad}^2$.
and so of the rest that haue like relation.

The marking of the men.

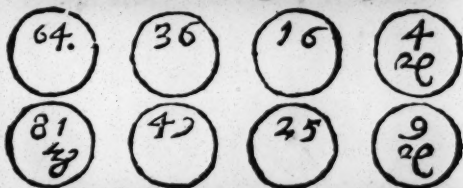
The first order of roundes in bothe
nũbers, must haue the signe of the
roote vpon them al aiter this maner.

8 $\sqrt{\quad}$	6 $\sqrt{\quad}$	4 $\sqrt{\quad}$	2 $\sqrt{\quad}$
9 $\sqrt{\quad}^2$	7 $\sqrt{\quad}^2$	5 $\sqrt{\quad}^2$	3 $\sqrt{\quad}^2$

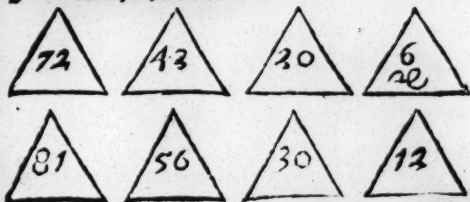
The

The Philosophers game.

The second order of roundes founde out as befoze, be not all marked with collicall signes, but onely.4. and.9. with is the roote and.81. with the quadzate. The rest haue none, because amonge their aduersaries men there is none that can be collicall roote to them (in such maner as this game requireth.



The first order of triangles (haupng the same numbers that haue bene taught befoze) do all lack the collicall signes, except onely.6. which is signed with the roote.

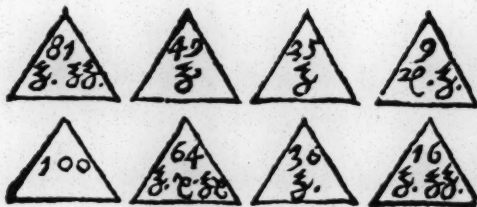


C.ij.

The

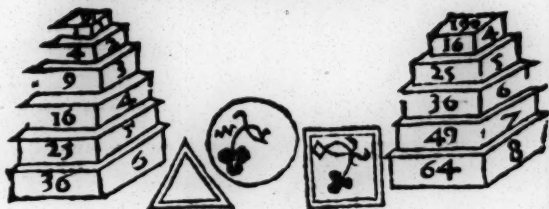
The Philosophers game.

The seconde order of triangles, haue all excepte one (whiche is the number of.100.) their collicall signes, as 9. bothe of the roote and of the quadzate, 25.36. and. 49. haue the signe of the quadzate. 64. of the quadzate and the cube, and also the quadzate of cube. 16. and. 81. of the quadzate, and the foure squared quadzate.



In the firste order of squares, onely 15. is marked with the roote, all the rest doe want theyr collicall sygnes in thys game.

The Philosophers game.



153	91	45	15
			7c

190	120	66	28
			.

The seconde order of squares hath. 3. numbers marked with cosicall signes, that is. 25. and. 225. wpth the signe of the quadzate. 81. is marked with the sygne of the quadzate and the soure-squated quadzate.

D. 114.

And

The Philosophers game.

289.	169.	81. 3.33.	25. 3.
361.	225. 3.	121.	49.

And thus haue you all the men that be marked with cosicall sygnes.

The setting in aray.

The teachers of this kynde of play-
ing, doe not so well allowe, the for-
mer kynde of placing or any other,
as the naturall placing of euey man
vnder him of whome he aryseth. So thet
conteyne. 6. ranks in length, extending
to the furthestmoste edge of the Table
after this sorte.

[illegible]

The Philosophers game.

The marching or moving.

The men maye remoue euery way, into boode places, forwarde, backe, warde, towarde both sydes, directe or cornerwise. So that the rounde men remoue into the next space, the triangles into the thirde place, and the squares into the fourth place, accompting that place in which they stande for one.

Also euery man sauing the two kynges to besiege his enemye, or to flye from the siege him self, may remoue the knights draught in chesse, but neither take anye man (except it be by siege) nor erect a triumphe by suche motions. The kynges moue euen as squares, but that they haue not the flyinge draughte.

It is compted lawefull amonge suche as wyll so agree, that the Triangles and Squares, maye remoue into boode places, though the spaces betwene be occupied of other men.

The Philosophers game.

The maner of takynge.

The men may be taken seven ways by Obsidion, by Equalitie, by Addition, by Subtraction, by Multiplication, by Diuision, and by Collicall Sygnes.

Of takynge by Obsidion.

All men maye be taken by Obsidion when by soure men they be letted of theyr ordinarie dyanghte, as hath bene taught before.

Of takynge by Equalitie.

By Equalitie maye these men take or be taken, as hath bene sayde before, 9. 16. 25. 36. 49. 64. 81, as yf after you haue played your .9. you see youre aduersaryes .9. stande in
your

The Philosophers game.

your mans draught, you may take him
by not remouyng into his place, vnlesse
you espye him standing in your draught
befoze you playe, then muste you take
him by and remoue into his place.

Of takynge by Addition.

The takynge by Addition is all one
with the first kynde of play, in all
respectes, sauving that some require
the men that shoulde take by Addition
to stande in the next spaces to him that
is taken, either directly, or cornerwyle,
but the former waye is better.

Of taking by subtraction.

That whiche was sayde in the first
kinde of subtraction and that whi-
che was last sayde of Addition may
be bothe referred hyther. For this sub-
traction

The Philosophers game.

straction differeth not from the former,
but for the opinion of them, that would
haue the two takers stande onehpe in
the nexte spaces to hym that is taken.

¶ Of takyng by Mul- tiplication.

Takyng by multiplication doth dif-
fer. For in this kynde of playng, it
is thus. When your man standeth
so, that beyng lesser then your aduersa-
ries man, you may multiplie your man
by the voyde spaces betwene them, and
the product is all one wth the aduersarye,
you maye take hym vp, not remouynge
into his place, except you espye hym so,
befoze you remoue your man.

¶ Of takynge by Di- uision.

Lykewise

The taking by Division.

Likewise by Division, if your man
 beynge greater then the aduersarye,
 stande so, that beynge deuyded by
 the boorde spaces, the quotient is all one
 with the aduersarye, you maye take
 hym vp, not remouynge into hys place,
 vnlesse you see hym so standynge before
 you drawe.

Of taking by Collicall signes.

Every Collicall sygnes anye man that
 hath these signes, 3. .e. 33. 3e.
 meeting wth his roote in his ordinary
 draught that hath this signe e. taketh
 him vp, or elles is taken of him, with-
 out remouynge into his place, except he
 maye take him before he remoue.

Of the Kynges, and their taking.

The

The Philosophers game.

The king of the even must be foure square, hauing sixe steppes, euery one lesser then other, on one syde he muste haue on him these rootes. 1. 2. 3. 4. 5. 6. on the other syde the quadzates arising of these rots, that is 1. 4. 9. 16. 25. 36. ¶ The king of the odde men, muste haue but fyue steppes, that is. 4. 5. 6. 7. 8. lackyng the rootes that he can not ende in. 1. The quadzates of hys rootes be these. 16. 25. 36. 49. 64. These muste be so set on, that the least must be hyghest and the greatest lowest.

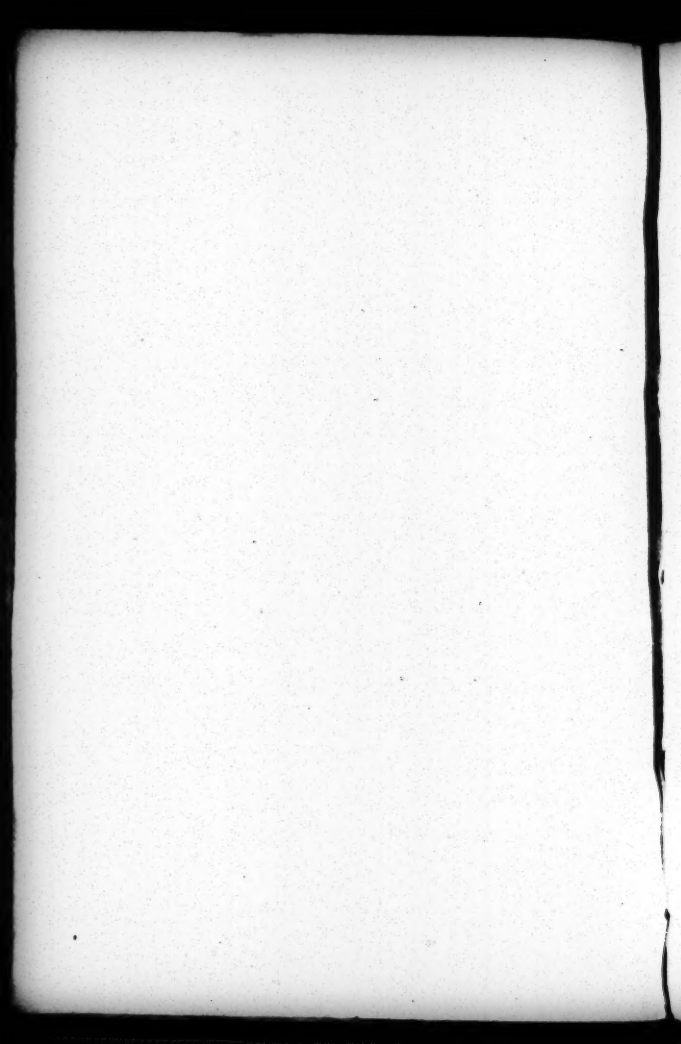
¶ The kinges be taken by Obsidi-
on, or yf theyr Pyramidall number, be
taken by anye of the afo: sayde meanes.
Also yf by suche meanes you can take
all his quadzates one after another.

¶ The priuilege of the
king.

The Captiues game.

If anye of the Kynges quaryates be
taken, he maye redeme it by anye of
his men hauing the same number,
and muste remoue into hys place, whi-
che redeemed hym. But yf he haue
none of the same number, he maye re-
deme hym for anye man of hys, that his
aduersarye wyll chuse, and lyke
wyse remoue into hys place
by whome he is re-
demed.

A table





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1st item - perfect2nd item - want: A₂ andand sig E/~~1~~

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Eas. line

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